

# Design and Performance Criteria for Mine Rescue Ensembles

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## Project Goals

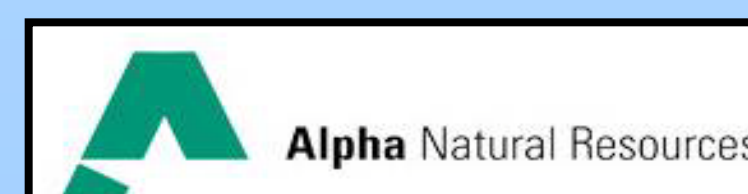
- Develop appropriate design and performance requirements for ensembles worn by mine rescue teams during emergency response
- Establish a best practice/guidance document and produce recommendations for standards for mine rescue ensembles

## Background

- The Mine Improvement and New Emergency Response (MINER) Act was passed by Congress in 2006. Provisions of the MINER Act were intended to improve the mine rescue service.
- Historically, there has been no consistency in protective clothing and equipment worn by various mine rescue teams, although they could respond to the same emergency.
- No guidance documents, standards or recommended best practices exist that establish minimum design and performance criteria.

## Stakeholders

- Mine Rescue Teams
- United Mine Workers of America
- Mine Operators
- Ensemble Manufacturers / Material Suppliers
- Government Agencies



## Partnerships

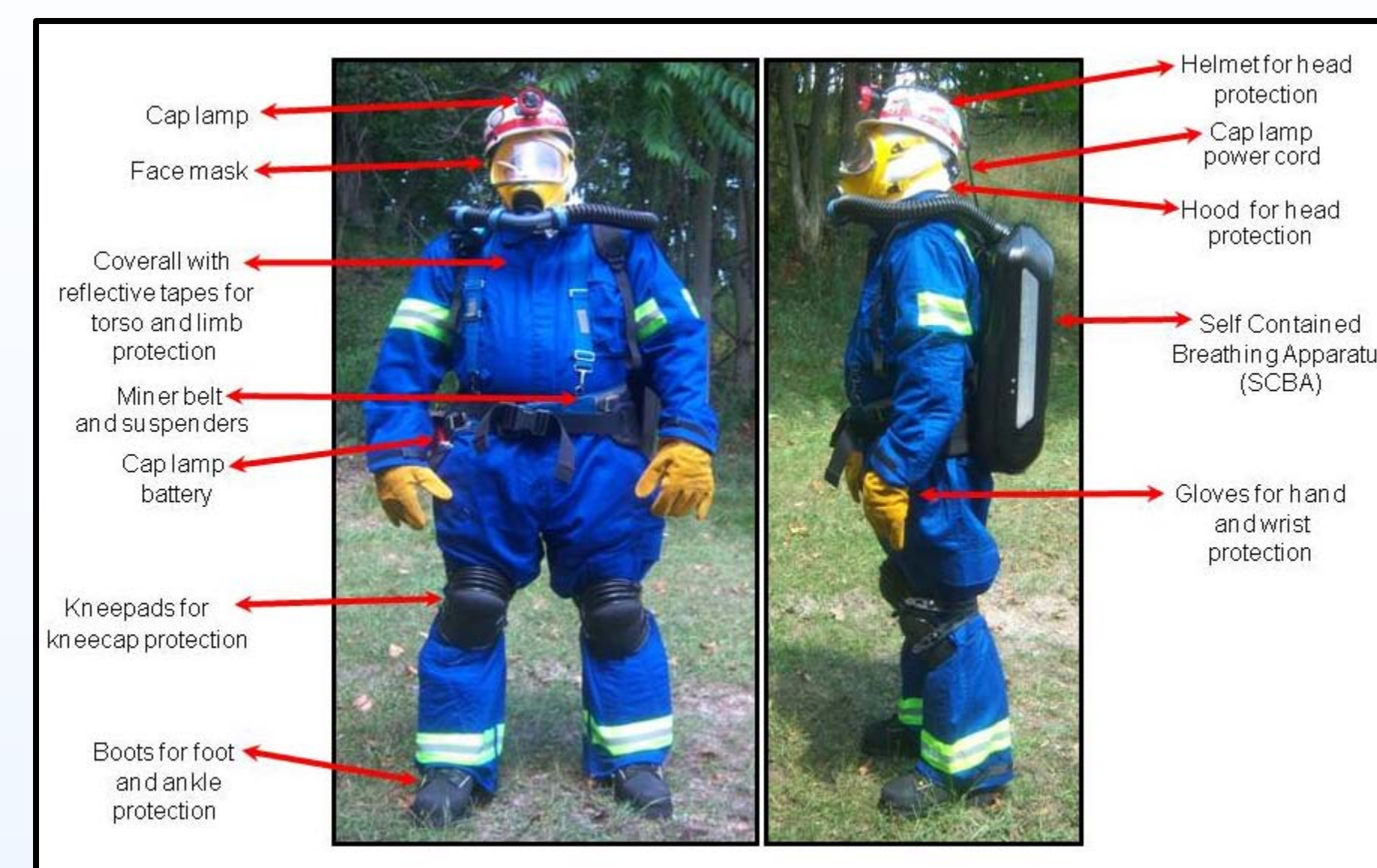


Fig 1. Components of a typical mine rescue ensemble



Fig 2. Different types of mine rescue ensembles used in the U.S.

## Procedure

- Identify the specific hazards and use conditions related to mine rescue ensembles
- Investigate mine rescue team needs related to garments, helmets, hoods, gloves, boots, SCBA, visibility, flammability resistance, and eye/face protection devices
- Identify current products in use or that could be used and performance properties of the products
- Examine mine rescue protective clothing and equipment to identify existing limitations, gaps and best practices
- Select available test methods that can assess or measure critical performance properties (e.g. human factors and physical properties)
- Analyze the findings to determine if the selected test methods discriminate product performance consistent with field expectations
- Establish design and performance criteria for mine rescue ensembles that include evaluation of the interoperability and integration of all protective clothing and equipment components

*Disclaimer: The findings and conclusions in this poster have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.*

## Significance

- As of March 2010, there were 408 mine rescue teams comprised of 3609 mine rescue team members. These teams are responsible for emergency response in 973 mines (coal, metal and non-metal) in the United States.
- Mine rescue team activities include: rescuing miners, providing first aid, erecting and extracting mine seals, underground and surface fire fighting, barricading, recovery, seismic locating, and responding to HAZMAT and surface disasters.
- This project will utilize previous NIOSH research from the fire service and apply the applicable findings to personal protective equipment used for underground rescue.

## Project Milestones and Timeline

Activity	Completion
Complete research protocol	Q1 2011
Complete external peer-review	Q2 2011
Obtain approval from HSRB	Q3 2011
Complete human subject testing	Q2 2012
Complete data analysis, recommendations and guidance	Q3 2012
Project completion/journal articles	Q3 2013

## Expected Project Outputs / Outcomes

- Presentations at mining and personal protective equipment conferences
- Peer reviewed publications
- Produce best practice/guidance document for mine rescue ensembles
- Use of project outputs in the development of new standards for assessing mine rescue ensembles